The Headwaters parameter group includes parameters that define locations for Headwater Flash Flood Guidance (HFFG)

Input Data

The following input is used to define headwater parameters.

Record	Field	Variable	Format	Description
1	1	type	a4	Guidance type code 'HFFG' - Headwater
	2	hdid	a8	Location identifier for headwater 1/
	3	desc	a20	Description
	4	strnam	a20	Stream name
	5 6 7	latd latm lats	i2 i2 i2	Latitude of the centroid of area in degrees, minutes, and seconds
	8 9 10	lond lonm lons	i3 i2 i2	Longitude of the centroid of area in degrees, minutes, and seconds
2	1	iqopth	i1	High flow adjust option: 0 - no adjustment 1 - forecast flow at hours entered on record 3 2 - highest forecast flow over next hours entered on record 3 3 - highest forecast flow in time series (times on record 3 not used) 4 - reduce runoff by storm runoff
	2	iropth	i1	Runoff adjust option: 0 - no adjustment 1 - adjust runoff (record 4 required as multipliers) 2 - use fields as ffg (record 4 required) 3 - use threshold runoff as ffg (fields 6-10)
	3	pcimpv	f4.2	Percent impervious (decimal fraction or whole percent, range 1-99 percent). Default is 0. Use with certain event API models

Record	Field	Variable	Format	Description
	4	rcid	a8	Rating curve identifier to get flow at flood stage from RFS database (field 5 = 0)
	5	fsflow	f6.0	Flow at flood stage (not used when identifier entered in field 4 above)
	6	upk1	f6.0	Unitgraph peak flow (or threshold runoff) for 1 hour. (Negative number for percent of 3 hour FFG, e.g. -60 for 60% of 3 hr FFG.) 2/
	7	upk2	f6.0	Same for 3 hours, no percent
	8	upk3	f6.0	Same for 6 hours
	9	upk4	f6.0	Same for 12 hours (optional)
	10	upk5	f6.0	Same for 24 hours (optional)
	11	lath	i2	1/2 width of area in minutes of latitude
	12	lonh	i2	1/2 width of area in minutes of longitude
(Record 3 required when field 1 on record 2 equals 1, 2 or 3.)				
3	1	taq1	f2.0	Time to adjust flow for 1-hour duration. Default 12 hours
	2	taq2	f2.0	Time to adjust flow for 3-hour duration. Default is taq1.
	3	taq3	f2.0	Time to adjust flow for 6-hour duration. Default is taq1.
	4	taq4	f2.0	Time to adjust flow for 12-hour duration. Default is taq1.
	5	taq5	f2.0	Time to adjust flow for 24-hour duration. Default is taq1.
	6	qtsid	a8	Identifier of forecast flow time series
	7	dtcq	a4	Data type code of forecast flow time series
	8	intq	i2	Time interval of forecast flow time series

Record	Field	Variable	Format	Description
(Record 4 required when field 2 on record 2 equals 1 or 2.)				
4	1	hinten1	f6.2	Intensity value for 1 hour, interpolation of value depends on inopth in field 2 of record 2: 1 - factor applied to runoff 2 - use value as ffg
	2	hinten2	f6.2	Intensity for 3 hours
	3	hinten3	f6.2	Intensity for 6 hours
	4	hinten4	f6.2	Intensity for 12 hours
	5	hinten5	f6.2	Intensity for 24 hours
5	1	wt	f3.2	Weight for area 3/
	2	arid	a8	Basin identifier 3/
Repeat fields 1 and 2 in pairs for up to 15 basins.				
Identifier 'ENDID' terminates list of basins.				

NOTES:

1/ Use assigned Handbook 5 identifiers for gaged locations and other approved identifiers for zones, counties, etc.

2/ Values in fields for unitgraph peak flows (fields 6-10) are threshold runoffs in hundredths of inch multiplied by 100 when rating curve identifier (field 4) is blank and flow at flood stage (field 5) is less than 10.

3/ If field 1 is negative (-10) for the first area, the lowest flash flood guidance value of all the given areas will be used. If field 1 for each given area is zero, the flash flood guidance value will be an average of the values for the given areas. If field 1 for each given area is a positive value (weights must sum to 1.00), the flash flood guidance value will be a weighted average of values from the given areas. If only one MAP is required, the weight defaults to 1.0.

Sample Input

To define or redefine locations for headwaters, the following input would be used:

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7
HFFG FRAT1    FRANKLIN             HARPETH R            321000  873000
 0 0   0 FRAT1          0  6000  5500  5300  5100  4200     0     0
      0 FRAT1     0 ENDID
HFFG KINT1    KINGSTON SPR         HARPETH R            320800  894000
 0 0   0           11800 18000 15000 14000 13300 10900     0     0
     55 KINT1UPR 45 KINT1LWR  0 ENDID
```

With base flow adjustment and intensity adjustment:

```
   ----+----1----+----2----+----3----+----4----+----5----+----6----+----7
   HFFG KINT1    KINGSTON SPR         HARPETH R            320800  894000
    1 1   0 KINT1         0 18000 15000 14000 13300 10900     0     0
        6     8    12    18    24 KINT1    QINE   6
      120   105   100   100   100
        55 KINT1UPR 45 KINT1LWR  0 ENDID
```

Use runoff as flash flood guidance:

```
   ----+----1----+----2----+----3----+----4----+----5----+----6----+----7
   HFFG SUNM2    SUN CITY MD          WINDING R                  0       0
    0 3   0 SUNM2         0 18000 15000 14000 13300 10900     0     0
        70 SUNM2UPR 30 SUNM2LWR  0 ENDID
```